

**REMARKS**

This Amendment is being filed in response to the final Office Action dated August 6, 2008, pursuant to 37 C.F.R. § 1.116. In view of these amendments and remarks this amendment should be entered, the application allowed, and the case passed to issue. No new matter is introduced by this amendment, and this amendment clearly places the application in condition for allowance.

Claims 1-21 are pending in this application. Claims 1-21 are rejected. Claim 18 is amended in this response.

***Claim Rejections Under 35 U.S.C. § 103***

Claims 1-3, 5, 6, and 11-14 were rejected under 35 U.S.C. § 103 as being unpatentable over Fujii et al. in view of Nelson et al. (US 6,150,049) and Kaufman et al. (US 4,588,661). This rejection is traversed, and reconsideration and withdrawal thereof respectfully requested. The following is a comparison between the invention, as claimed, and the cited prior art.

An aspect of the invention, per claim 1, is a fuel cell, comprising a membrane electrode assembly, and a bipolar plate having first and second opposing sides disposed outside the membrane electrode assembly. The bipolar plate is porous, and comprises a first gas passage formed on a surface on the first side of the bipolar plate facing the membrane electrode assembly. A second gas passage is formed on another surface on the second side of the bipolar plate. A communicating passage allows the first gas passage and second gas passage to communicate with each other. A gas inlet introduces gas connected to one of the first gas passage and second gas passage. A gas outlet discharges gas connected to the other of the first gas passage and second gas passage.

The Examiner acknowledged that Fujii et al. do not disclose a bipolar plate. The Examiner considered it obvious to modify the apparatus of Fujii et al. by incorporating bipolar plates as taught by Nelson et al. to increase hydration distribution along the membrane. The Examiner concluded that it would have been obvious to substitute the porous carbon plates of Kaufman et al. into the fuel cell of Fujii et al. and Nelson et al. to provide a more uniform gas distribution over the face of the respective anode and cathode to thereby improve the overall performance of the fuel cell.

According to the invention of claim 1, a bipolar plate has first and second opposing sides disposed outside the membrane electrode assembly, wherein the bipolar plate is porous, and comprises a first gas passage formed on a surface on the first side of the bipolar plate facing the membrane electrode assembly, and a second gas passage formed on another surface on the second side of the bipolar plate. In the claimed structure, water can move through the bipolar plate and, thus uniform water distribution in the cell can be maintained (see Specification at page 8, line 13, to page 9, line 19 and FIG. 4).

Fujii et al. fail to disclose the feature that the first gas passage is formed on a surface of the bipolar plate and the second gas passage is formed on another surface of the bipolar plate. Nelson et al. and Kaufman et al. do not cure the deficiencies of Fujii et al. Even if the gas diffusion layer of Nelson et al. and the porous carbon plate of Kaufman et al. are combined with Fujii et al, the present invention cannot be obtained, because the combination inevitably lacks the above-mentioned feature.

Obviousness can be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge readily

available to one of ordinary skill in the art. *In re Kotzab*, 217 F.3d 1365, 1370 55 USPQ2d 1313, 1317 (Fed. Cir. 2000); *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). There is no suggestion in Fujii et al., Nelson et al., and Kaufman et al. to modify the fuel cell of Fujii et al. to provide a bipolar plate having first and second opposing sides disposed outside the membrane electrode assembly, wherein the bipolar plate is porous, and comprises a first gas passage formed on a surface on the first side of the bipolar plate facing the membrane electrode assembly, and a second gas passage formed on another surface on the second side of the bipolar plate, as required by claim 1, nor does common sense dictate the Examiner-asserted modification. The Examiner has not established that there would be any obvious benefit in making all the asserted modifications of Fujii et al., Nelson et al., and Kaufman et al. to obtain the claimed fuel cell. See *KSR Int'l Co. v. Teleflex, Inc.*, 500 U.S. \_\_\_\_ (No. 04-1350, April 30, 2007) at 20.

The mere fact that references can be combined or modified does not render the resulting combination obvious unless the prior art also suggests the desirability of the modification. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). Applicants submit that the combination of Fujii et al., Nelson et al., and Kaufman et al. does not suggest the claimed fuel cell.

The only teaching of the claimed fuel cell is found in Applicants' disclosure. However, the teaching or suggestion to make a claimed combination and the reasonable expectation of success must not be based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Claim 4 was rejected under 35 U.S.C. § 103 as being unpatentable over Fujii et al. in view of Nelson et al. and Kaufman et al. and further in view of Issacci et al. (US 2003/0129468).

Claims 7, 8, and 15-17 were rejected under 35 U.S.C. § 103 as being unpatentable over Fujii et al. in view of Nelson et al. and Kaufman et al. and further in view of Takahashi et al. (US 7,049,016).

Claims 9 and 10 were rejected under 35 U.S.C. § 103 as being unpatentable over Fujii et al. in view of Nelson et al. and Kaufman et al. and further in view of Ringel (US 5,932,366).

These rejections are traversed, and reconsideration and withdrawal thereof respectfully requested. The combinations of Fujii et al., Nelson et al., and Kaufman et al. with Issacci et al., Takahashi et al., and Ringel et al. do not suggest the claimed fuel cells because Issacci et al., Takahashi et al., and Ringel et al. do not cure the deficiencies of Fujii et al., Nelson et al., and Kaufman et al. Issacci et al., Takahashi et al., and Ringel et al. do not suggest a bipolar plate having first and second opposing sides disposed outside the membrane electrode assembly, wherein the bipolar plate is porous, and comprises a first gas passage formed on a surface on the first side of the bipolar plate facing the membrane electrode assembly, and a second gas passage formed on another surface on the second side of the bipolar plate, as required by claim 1

Claim 18 was rejected under 35 U.S.C. § 103 as being unpatentable over Fujii et al. in view of Nelson et al. This rejection is traversed, and reconsideration and withdrawal thereof respectfully requested. The following is a comparison between the invention, as claimed, and the cited prior art.

An aspect of this invention, per claim 18, is a fuel cell comprising a membrane electrode assembly, a bipolar plate disposed outside the membrane electrode assembly and a cooling mechanism which cools the bipolar plate. The bipolar plate is solid, and comprises a gas inlet for introducing gas and a gas outlet for discharging gas. A gas diffusion layer is provided between the membrane electrode assembly and the bipolar plate. First gas passages are formed

on a surface on the side of the membrane electrode assembly, wherein one end of each first gas passage is connected to the gas inlet and the other end of each first gas passage is connected to a return part. Second gas passages are formed parallel and adjacent to the first gas passages one after the other on the surface on the side of the membrane electrode assembly, wherein one end of each second gas passage is connected to the first gas passages via the return part and the other end of each second gas passage is connected to the gas outlet. The cooling mechanism cools the bipolar plate so that the temperature of the gas flowing through the first gas passages is lower as the gas inlet is nearer.

Claim 18 encompasses the embodiment shown in Figs. 23-25 of the present disclosure. In this embodiment, the first gas passages 33c and the second gas passages 33e are formed one after another (alternately) and this feature enables overall water movement between the first gas passages 33c and the second gas passages 33e. Fujii et al. neither teach nor suggest this feature.

Nelson et al. do not cure the deficiencies of Fujii et al. Even if the gas diffusion layer is combined with Fujii et al., the combination lacks the above-mentioned feature and overall water movement between the first passage 211A and the second passage 211B cannot be expected. The combination of Fujii et al. and Nelson et al. only enables water movement at a limited portion near the seal member CS1.

Obviousness can be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge readily available to one of ordinary skill in the art. *In re Kotzab*, 217 F.3d 1365, 1370 55 USPQ2d 1313, 1317 (Fed. Cir. 2000); *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). There is no suggestion in Fujii et al. and

Nelson et al. to modify the fuel cell of Fujii et al. to provide a bipolar plate comprising first gas passages formed on a surface on the side of the membrane electrode assembly, wherein one end of each first gas passage is connected to the gas inlet and the other end of each first gas passage is connected to a return part, and second gas passages formed parallel and adjacent to the first gas passages one after the other on the surface on the side of the membrane electrode assembly, wherein one end of each second gas passage is connected to the first gas passages via the return part and the other end of each second gas passage is connected to the gas outlet, as required by claim 18, nor does common sense dictate the Examiner-asserted modification. The Examiner has not established that there would be any obvious benefit in making all the asserted modifications of Fujii et al. to obtain the claimed fuel cell. *See KSR Int'l Co. v. Teleflex, Inc.*, 500 U.S. \_\_\_\_ (No. 04-1350, April 30, 2007) at 20.

The mere fact that references can be combined or modified does not render the resulting combination obvious unless the prior art also suggests the desirability of the modification. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). Applicants submit that the combination of Fujii et al. and Nelson et al. does not suggest the claimed fuel cell.

The only teaching of the claimed fuel cell is found in Applicants' disclosure. However, the teaching or suggestion to make a claimed combination and the reasonable expectation of success must not be based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Claims 19-21 were rejected under 35 U.S.C. § 103 as being unpatentable over Fujii et al. in view Nelson et al. and further in view of Takahashi et al.

This rejection is traversed, and reconsideration and withdrawal thereof respectfully requested.

The combination of Fujii et al., Nelson, and Takahashi et al. do not suggest the claimed fuel cells because Takahashi et al. do not cure the deficiencies of Fujii et al. and Nelson et al. Takahashi et al. do not suggest the first gas passages formed on a surface on the side of the membrane electrode assembly, wherein one end of each first gas passage is connected to the gas inlet and the other end of each first gas passage is connected to a return part, and second gas passages formed parallel and adjacent to the first gas passages one after the other on the surface on the side of the membrane electrode assembly, as required by claim 18.

The dependent claims are allowable for at least the same reasons as the respective independent claims from which they depend and further distinguish the claimed invention. For example claims 15-17 and 19-21 require a controller functioning to perform specific operations, which are not suggested by the cited references. It is well settled that it is not sufficient for a prior art controller to be merely capable of performing certain operation in order to assert obviousness, but there must be a suggestion to modify the controller to perform the claimed operation.

In view of the above amendments and remarks, Applicants submit that this amendment should be entered, the application allowed, and the case passed to issue. If there are any questions regarding this Amendment or the application in general, a telephone call to the undersigned would be appreciated to expedite the prosecution of the application.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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